

## WHAT IS CLAIMED IS:

1        1. A method of inspecting a multilayer gas sensing device which comprises a  
2 sensor cell including a solid electrolyte plate, a measured gas side electrode  
3 placed on a surface of said solid electrolyte plate to be exposed to a measured gas  
4 and a reference electrode placed on a surface of said solid electrolyte plate to be  
5 exposed to a reference gas, with said measured gas side electrode being coated  
6 with a porous diffusion resistance layer in a stacked condition and said diffusion  
7 resistance layer being further coated with a dense protective layer in a stacked  
8 condition, said method comprising the steps of:

9              immersing said multilayer gas sensing device in a conductive inspection  
10 solution;

11              placing said reference electrode into non-contact condition with said  
12 conductive inspection solution;

13              applying a voltage between said conductive inspection solution and said  
14 reference electrode to measure a current flowing between said conductive  
15 inspection solution and said reference electrode; and

16              making a decision as to whether or not insulation is kept between said  
17 conductive inspection solution and said reference electrode.

1        2. The method according to claim 1, wherein, for applying said voltage  
2 between said conductive inspection solution and said reference electrode, said  
3 voltage is applied between a reference side external terminal, which is electrically  
4 connected to said reference electrode and formed in an exposed state in the  
5 exterior of said multilayer gas sensing device and which does not come into  
6 contact with said conductive inspection solution, and said conductive inspection  
7 solution.

1       3.     The method according to claim 1, wherein said voltage to be applied  
2     between said conductive inspection solution and said reference electrode is in a  
3     range from 250V to 1000V.

1       4.     The method according to claim 1, wherein, when a current flowing  
2     between said conductive inspection solution and said reference electrode in  
3     response to the voltage application therebetween is below 5  $\mu$ A, said multilayer  
4     gas sensing device is decided to be a non-defective product.

1       5.     The method according to claim 1, wherein said conductive inspection  
2     solution is an ethanol.